Name: Date:

Polynomial Factoring solution (version 50)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 52 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(52)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 208}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-108}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{10 \pm 6\sqrt{3}\, i}{2}$$

$$x = 5 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 8i$ and $-4 - 5i$ in standard form $(a + bi)$.**

Solution

$$(7 + 8i) \cdot (-4 - 5i)$$

$$-28 - 35i - 32i - 40i^2$$

$$-28 - 35i - 32i + 40$$

$$-28 + 40 - 35i - 32i$$

$$12 - 67i$$

Polynomial Factoring solution (version 50)

3. **Write function $f(x) = x^3 + 10x^2 + 19x - 30$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	10	19	-30
-5		-5	-25	30
	1	5	-6	0

$$f(x) = (x + 5)(x^2 + 5x - 6)$$

$$f(x) = (x + 5)(x - 1)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 2)^2 \cdot (x - 3) \cdot (x - 8)$$

Sketch a graph of polynomial $y = p(x)$.